

TRIUMPH

Spitfire
TR6

DESCRIPTION

All models use front disc and rear drum brakes. A tandem piston master cylinder which consists of two independent and complete hydraulic circuits is used. A pressure differential valve is used on all models to detect low pressure in either front or rear brake systems. When a pressure differential exists between the two circuits, indicating a failure, the pressure differential valve completes the circuit to the brake failure warning light on the instrument panel. A vacuum servo unit for power braking is also used on some models.

ADJUSTMENT

DISC BRAKES

No adjustment required.

DRUM BRAKES

Adjust brake while revolving wheel and turning adjustment screw clockwise to lock brake. Loosen adjuster screw one notch at a time until wheel revolves freely. *NOTE* — Do not confuse binding with normal drag caused by hub grease and oil in differential.

PARKING BRAKE

NOTE — Adjustment of rear brakes will normally provide satisfactory parking brake adjustment. If cables are stretched, further adjustment is performed as follows: Hoist vehicle in rear, release parking brake and lock both rear brake drums with adjusters. Disconnect return springs from backing plate and remove clevis pin from lever. Adjust clevis on each brake equal amounts. Cables are too tight if clevis pins cannot be inserted into clevis and relay lever easily. Secure clevis pins, reconnect return springs and adjust cable brackets to provide slight spring tension. Adjust rear brakes as previously outlined.

HYDRAULIC SYSTEM BLEEDING

If air enters brake system, bleed system effected. Keep fluid level in reservoir above dividing partition while bleeding system. *NOTE* — Do not apply brakes hard until all air is expelled from system. This will prevent the brake pressure differential valve from actuating brake warning light. Clean bleed valves and start bleeding with rear brakes first. When bleeding rear brakes, release handbrake and turn shoe adjusters to lock brakes. Connect a hose to bleed valve farthest from master cylinder and submerge free end of hose in a jar containing clean brake fluid. Unscrew bleed valve about 1/2 turn, depress brake pedal, but not to end of stroke, and allow pedal to return slowly. Pause between each pedal stroke and note when bubbles cease flow from fluid being pumped into jar. Tighten bleeder valve when pedal is depressed and repeat procedure with other brakes.

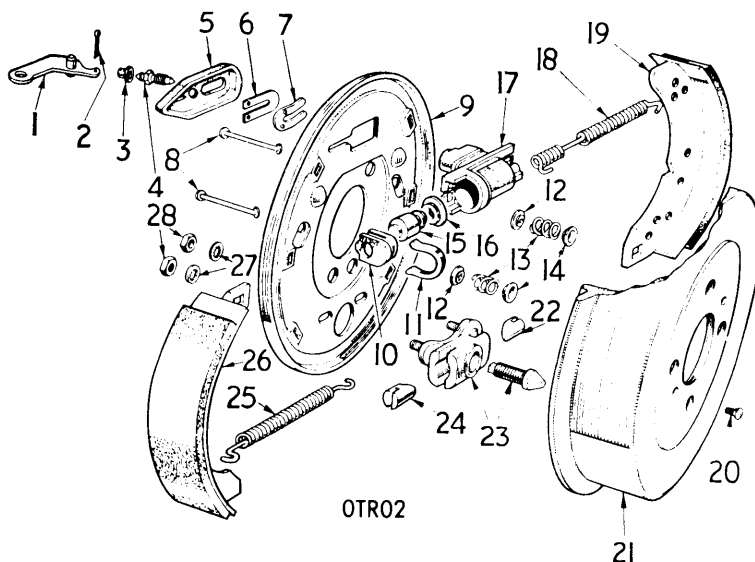
CENTERING PRESSURE DIFFERENTIAL VALVE

If brake failure warning light stays on after bleeding brakes (with ignition on and engine running), center valve shuttle as follows: Connect a rubber hose to bleeder valve on brake circuit (front or rear) opposite to circuit bled last. With hose in partially filled jar, open bleed valve and turn on ignition, but do not start engine. Brake failure warning light will glow. Exert a steady pressure on brake pedal until brake light dims and a click is felt in pedal as shuttle returns to its mid-position. Tighten bleeder screw. *NOTE* — If pedal is applied too hard, shuttle will move to other side of valve and procedure must be repeated.

REMOVAL & INSTALLATION

FRONT DISC BRAKE PADS

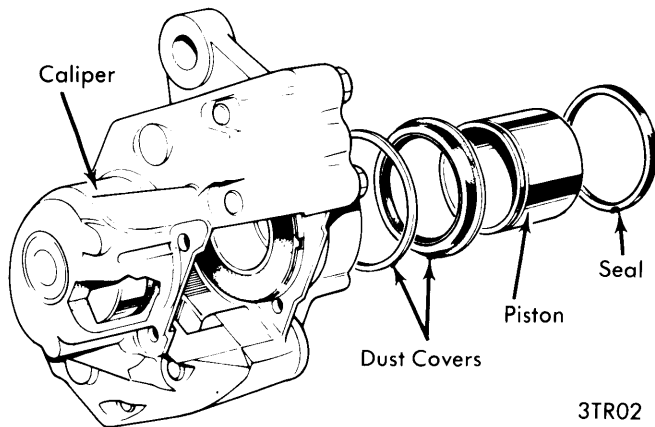
Removal & Installation — Hoist vehicle and remove front wheels. Release spring retainers, pad retainer pins and remove pads. To install, push piston back into cylinders and install pads, pins and spring retainer clips.



- | | |
|----------------------|----------------------------|
| 1 — Hand Brake Lever | 16 — Seal |
| 2 — Cotter Pin | 17 — Wheel Cylinder |
| 3 — Dust Cap | 18 — Return Spring |
| 4 — Bleed Valve | 19 — Brake Shoe |
| 5 — Dust Boot | 20 — Screw |
| 6 — Retaining Clip | 21 — Brake Drum |
| 7 — Retaining Clip | 22 — Adjuster Tappet |
| 8 — Pins | 23 — Adjuster Wedge & Body |
| 9 — Back Plate | 24 — Adjuster Tappet |
| 10 — Dust Boot | 25 — Return Spring |
| 11 — Clip | 26 — Brake Shoe |
| 12 — Pin Cups | 27 — Washers |
| 13 — Springs | 28 — Nuts |
| 14 — Pin Cups | |
| 15 — Piston | |

REAR BRAKE ASSEMBLY
(L.H. SIDE)

TRIUMPH (Cont.)



DISC BRAKE CALIPER

FRONT DISC BRAKE CALIPER

Removal & Installation — Remove brake pad as previously outlined. Loosen brake hose from brake line at support bracket and unscrew hose from caliper. Remove two bolts securing caliper and remove caliper. To reinstall, reverse removal procedure and bleed brakes.

FRONT DISC BRAKE ROTOR

Removal & Installation — Remove caliper as previously outlined. Remove hub dust cap, cotter pin, slotted nut and washer from axle. Remove hub with outer bearing race and outer part of inner race. Detach rotor from hub. To install, reverse removal procedure. Install new cotter pin, bearings and seal as necessary. Tighten slotted nut so hub has specified end play (.003-.005") and ensure that rotor is within specified maximum runout.

REAR BRAKE DRUM

Removal & Installation — Hoist vehicle and remove rear wheel. Remove two countersunk screws securing brake drum to hub. Release parking brake and remove brake drum. To install, reverse removal procedure.

REAR BRAKE SHOES

Removal — Remove brake drum as previously outlined. Remove parking brake cotter pin, shoe anchor pins, cups and springs. Disconnect return springs and lift shoes from abutments. Disconnect front shoe from parking brake lever and remove shoes.

Installation — Reverse removal procedure and lightly apply white grease (zinc base) to ends of shoes and cam faces. **CAUTION** — Do not allow grease to contact lining material. Readjust brakes when lining replacement is complete.

REAR BRAKE WHEEL CYLINDER

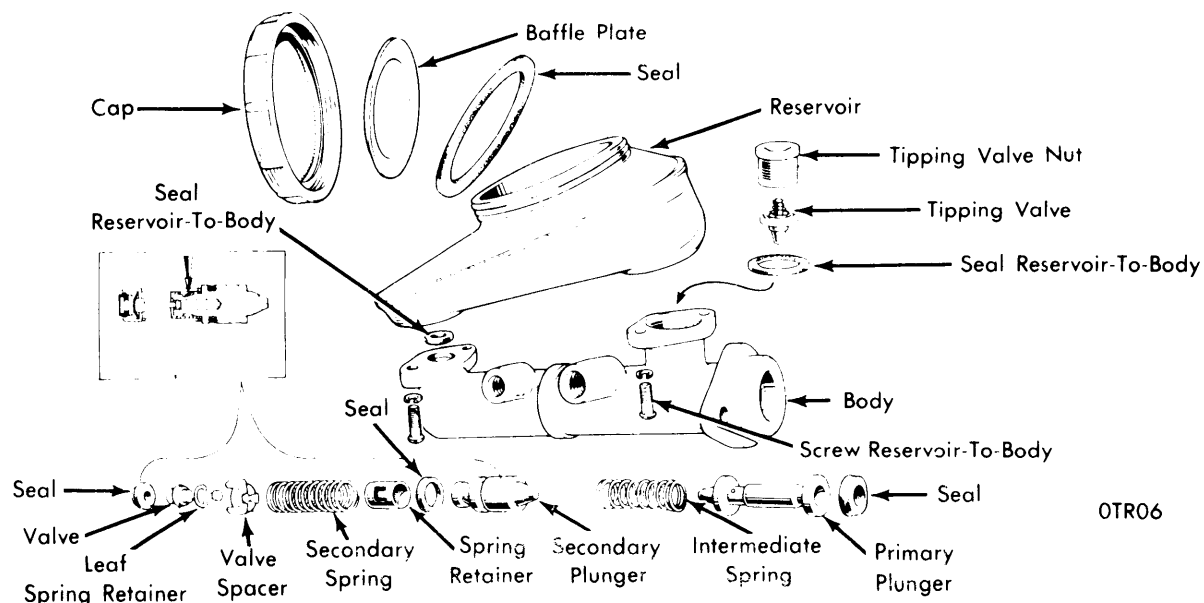
Removal & Installation — Remove brake shoes as previously outlined. Drain fluid, disconnect flex hose from steel line and unscrew hose from cylinder. Disconnect parking brake cable clevis, remove dust cover, retaining plate and spring clips. Remove wheel cylinder. To install, reverse removal procedure and bleed brakes.

MASTER CYLINDER

Removal & Installation — Empty fluid reservoirs, pull back rubber dust cover and remove clevis pins securing push rod to brake pedal on models without servo unit. Disconnect fluid lines and bolts securing master cylinder and remove unit. To install, reverse removal procedure and bleed brakes.

VACUUM SERVO UNIT

Removal & Installation — Remove master cylinder as previously outlined. Disconnect vacuum hose from check valve. Remove clevis pin from servo operating rod and brake pedal lever. Remove four nuts securing servo unit to firewall and remove servo with spacer. To install, reverse removal procedure.



TANDEM PISTON MASTER CYLINDER

TRIUMPH (Cont.)

PRESSURE DIFFERENTIAL VALVE

Removal & Installation — Disconnect electrical leads. Disconnect inlet and outlet lines and plug all ports to prevent loss of fluid and entry of dirt. Remove bolt securing valve and remove unit. To install, reverse removal procedure, bleed brakes and if necessary, center valve shuttle.

OVERHAUL

FRONT DISC BRAKE CALIPER

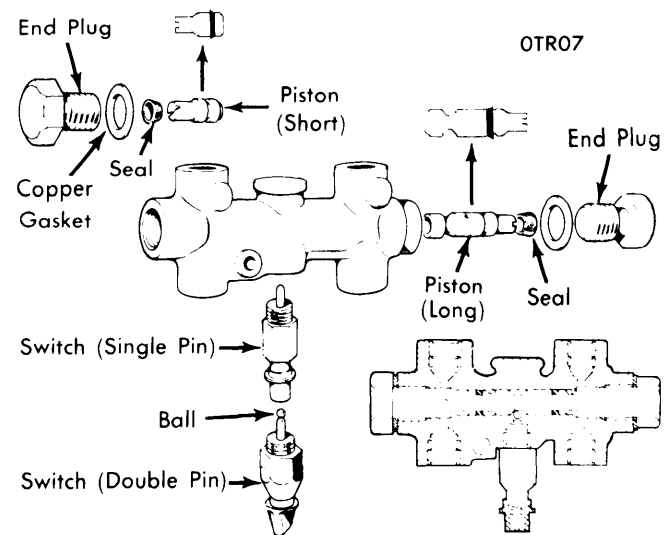
Disassembly — Remove caliper and brake pads. Remove circlip retaining piston dust covers and remove dust covers. Extract caliper piston using light air pressure if necessary. Use care not to interchange the pistons.

Cleaning & Inspection — Clean components in brake fluid or alcohol and examine caliper pistons and bores for wear or damage. Replace caliper if damage is present.

Reassembly — Install new piston seals in cylinder and place rubber dust cover projecting lip in recess. Insert piston being careful not to scratch cylinder. Pull outer lip of dust cover into recess in piston and install brake pads. Install brake caliper and bleed brakes.

REAR WHEEL CYLINDER

Disassembly — Remove wheel cylinder as previously outlined. Remove dust cover and withdraw piston. Remove seal from piston using fingers only.



PRESSURE DIFFERENTIAL VALVE

Cleaning & Inspection — Clean all parts in alcohol or brake fluid and examine cylinder bore and piston for score marks, ridges or corrosion. If either bore or piston is damaged, replace entire cylinder assembly.

Reassembly — Install new seal with lip towards bottom of cylinder. Lubricate seal with clean brake fluid, insert piston into cylinder and install dust cover. Reinstall cylinder and bleed brakes.

MASTER CYLINDER

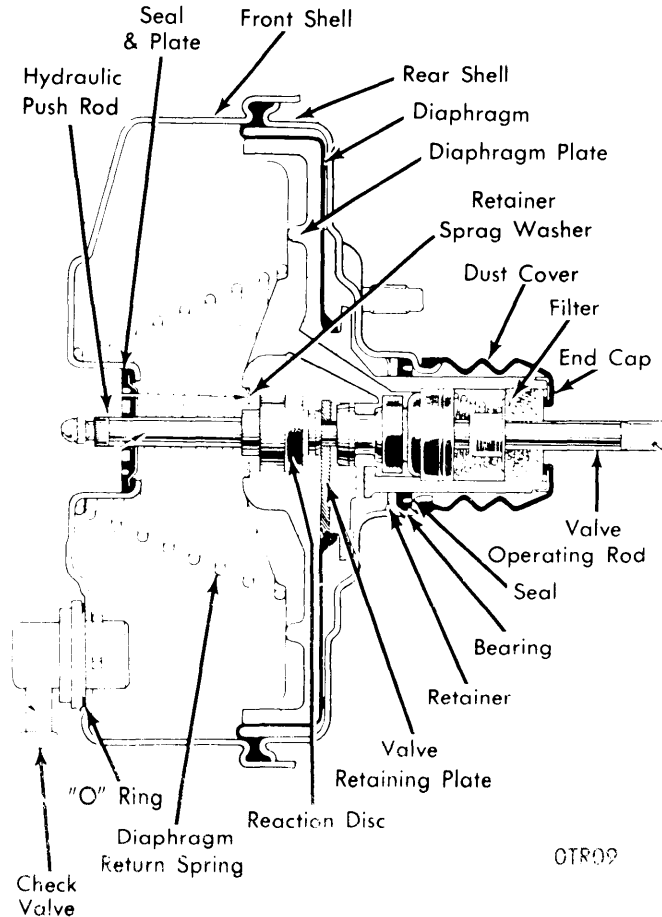
Disassembly — Remove master cylinder as previously outlined. Drain and discard fluid. Remove screws securing reservoir to cylinder. Depress push rod, remove snap ring and withdraw push rod with abutment plate. Use an Allen wrench to unscrew tipping valve securing nut and remove seal. Depress primary plunger and remove tipping valve. Remove internal parts either with compressed air to end inlet or by shaking cylinder body. Separate plunger and intermediate spring. Lift leaf of spring retainer, remove spring and center valve sub-assembly from secondary plunger. From valve stem, remove spring, valve spacer, spring washer and valve seal. Remove seals from primary and secondary plungers.

Cleaning & Inspection — Clean all servicable parts in brake fluid or alcohol. Examine cylinder bore for score marks, ridges or corrosion. Discard cylinder body even if only slight imperfections are found.

Reassembly — *NOTE* — Replace all seals with those contained in service repair kit. Prior to assembly, lubricate all parts in clean brake fluid.

1) Install seals on primary and secondary plungers. Install seal, smaller diameter leading, to valve head. Place spring washer on valve stem ensuring that convex side of washer is to valve. Place spring retainer to valve stem with keyhole leading. Slide secondary spring over spring retainer and up to secondary plunger.

2) Place secondary plunger and valve assembly between protected jaws of a vise and compress spring. Use a small screwdriver to press leaf spring retainer against secondary plunger and then compress leaf spring retainer with needle nose pliers against plunger. Remove plunger and valve assembly from vise and check retainer spring.



VACUUM SERVO UNIT

TRIUMPH (Cont.)

3) Install intermediate spring between primary and secondary plungers and insert into cylinder. Replace push rod, snap ring and rubber boot. Depress push rod and insert tipping valve. Install seal, secure nut and torque to specifications. Install reservoir and seal. Install master cylinder and bleed brakes.

VACUUM SERVO UNIT

NOTE — Overhauling unit consists of changing check valve, filter, dust cover, seal and plate assembly. Any other component failure requires complete unit replacement. Replacing filter is the only normal service required. A service repair kit is available for limited service.

Disassembly — 1) Remove servo unit as previously outlined. To remove check valve, note angle of valve in relation to servo housing. Use a suitable wrench to press down on valve and rotate counterclockwise $\frac{1}{2}$ turn.

2) Remove filter by pulling back dust cover and pulling out filter. For ease of filter installation, cut new filter diagonally.

3) Remove seal and plate assembly from front shell recess by gripping center rib with needle nose pliers. Use grease supplied in service kit to lubricate new seal and plate assembly when installing.

4) To check push rod for wear, place a straight edge across front shell recess. Measure clearance between end of push rod and straight edge. Clearance should be .011-.016" (.28-.41mm). Replace servo unit if clearance is incorrect. **NOTE** — Servo push rod to master cylinder clearance is set by factory and secured with Loctite. No attempt should be made to alter setting.

Reassembly — To reassemble components to servo unit, reverse disassembly procedures.

PRESSURE DIFFERENTIAL VALVE

Disassembly — Remove valve as previously outlined. Remove end plugs and discard copper washers. Remove nylon switch being careful not to lose ball (if equipped). Carefully push out valves and avoid scratching cylinder. Remove seals on pistons using fingers only.

Cleaning & Inspection — Clean all parts in brake fluid. Inspect cylinder and pistons for scoring or imperfections. Replace unit if parts show signs of wear. To test nylon switch, reconnect to warning light circuit and actuate plunger on switch by pressing it to an electrical ground.

Reassembly — Replace seals and copper washers with new parts provided in service repair kit. Lubricate parts with clean brake fluid during assembly. Install seals on pistons with lips facing outwards. Insert long piston into bore (slotted end out) until radiused groove is opposite switch plunger hole. Insert ball (if equipped) and screw in switch assembly, torque to specifications. **CAUTION** — Ensure that piston seals are never pushed across central hole in valve body as this will damage seals. Insert short piston into bore with slotted end out. Install plugs with new copper washers and torque to specifications.

TIGHTENING SPECIFICATIONS

| Application | Ft. Lbs. (mkg) |
|---|-----------------|
| Disc Brake Rotor-to-Hub | |
| Spitfire | 26-34 (3.6-4.7) |
| TR6 | 32-35 |
| Disc Brake Caliper-to-Mount Plate | |
| Spitfire | 50-65 (7.0-9.0) |
| TR6 | 50-55 (7.0-7.6) |
| Master Cylinder Tipping Valve Nut | 35-40 (4.8-5.5) |
| Pressure Differential Valve | |
| Plunger Switch | 2 (.28) |
| End Plugs | 16-20 (2.2-2.7) |

DISC BRAKE ROTOR SPECIFICATIONS

| Application | Disc Diameter In. (mm) | Lateral Runout In. (mm) | Parallelism In. (mm) | Original Thickness In. (mm) | Minimum Refinish Thickness In. (mm) | Discard Thickness In. (mm) |
|-------------|---------------------------|----------------------------|-------------------------|--------------------------------|--|-------------------------------|
| Spitfire | 9.000 (229) | .002 (.050) | ..... | ..... | ..... | ..... |
| TR6 | 10.875 (276) | .002 (.050) | ..... | ..... | ..... | ..... |

BRAKE DRUM SPECIFICATIONS

| Application | Drum Diameter In. (mm) | Original Diameter In. (mm) | Maximum Refinish Diameter In. (mm) | Discard Diameter In. (mm) |
|-------------|---------------------------|-------------------------------|---------------------------------------|------------------------------|
| Spitfire | 7.000 (178) | 7.000 (178) | ..... | ..... |
| TR6 | 9.000 (228) | 9.000 (228) | ..... | ..... |